



Graduate School of Operations  
& Information Sciences  
Naval Postgraduate School  
Monterey, California

# Graduate School of Operational and Information Sciences

Peter Purdue, Dean  
COL Bill Tarantino, Associate Dean



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**Naval Postgraduate School**  
M o n t e r e y , C a l i f o r n i a

# GSOIS

- Graduate Resident Programs consisting of 16 technical Curricula.
- Awards Master of Science Degrees and Ph.D. Degrees across four Academic Departments.
- Faculty number approximately 98 and educates approximately 500 Military and DOD Students.



# Mission:

To deliver graduate level education and conduct cutting-edge research in four non-traditional knowledge domains, in response to the needs of naval and military customers:

- Information Science and Technology
- Military Computer Science
- Military Operations Analysis and Research
- Special Operations and Related Defense Analyses



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# Emphasis:

- Mathematical, scientific, and technical skills to understand the state of the art and foster future improvements in military systems and operations
- Integration of subject matter contained in classical academic disciplines in militarily relevant ways
- Subject matter suited to the corporate university's military customer
- Faculty expertise in creative, efficient delivery methods, including distance learning



# Departments

- **Computer Science:** Peter Denning, Chair
- **Information Sciences:** Dan Boger, Chair
- **Operations Research:** Jim Eagle, Chair
- **Defense Analysis:** Gordon McCormick, Chair



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# Curricula

- Special Operations
- Information Warfare
- Electronic Warfare
- Psy Ops
- Joint C4I
- Computer Science
- Human Systems Integration
- Information Systems Technology
- Information Systems and Operations
- Software Engineering
- Operations Analysis
- Operational Logistics



# Characteristics of School

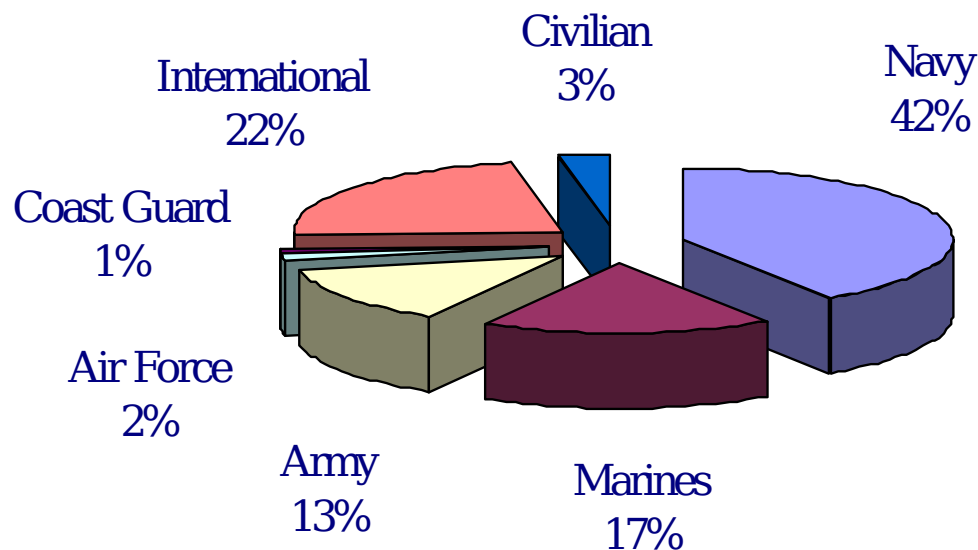
- Most closely represents the “Corporate University”
- Hence related to Military, not academic disciplines
- Many sponsors. Growing recognition for
  - Military Value
  - Academic Excellence
- Mathematics, Science and Technology emphasis
- Both academic excellence and military utility
- Successful research in:
  - student theses
  - Faculty (1/3 of time)



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# GSOIS Students



197 Navy  
84 Marines  
65 Army  
8 Air Force  
5 Coast  
Guard  
108  
International  
15 Civilian  
482 Total





# Operations Research

- First OR Masters Degree anywhere (Celebrated 50<sup>th</sup> Anniversary last Sept)
- Core belief in “Quantitative Assistance to Decision Makers”
- Recognized leader in military OR (personal niche: joint campaign analysis)
- Also prominent in optimization, stochastic processes, statistics, and simulation
- Extensive sponsored research
- Two tensions in Military OR today:
  - Model building vs. analysis and problem solving?
  - Military specialists or sub-specialists?



# Computer Science

- Contributor to and component of information sciences
  - Software Engineering
  - Computer/Information Assurance/Security
  - MOVES (Modeling, Virtual Environments and Simulation)
  - Computer Networking
  - Data and Knowledge Engineering (Database and Artificial Intelligence)
- Solid Reputation, Strong Leadership
- Very Popular with Students



# Information Sciences

- Conjunction of academic groups in response to new Navy IP community
  - IS&T, IW, ISO, EW, JC4I
  - 25 year struggle for recognition
  - Work-in-progress
- Warfare Laboratories: research, instruction, and operations (SIPRNET)
- SCIF: instruction and research supported by multiple SCI links
- Response to sponsor since 1994: Core and Tracks approach
- Also very popular curricula, further growth anticipated



# Defense Analysis

- Joint and operations emphasis (CINCSOC sponsor)
- Roots in special operations. Recent broadening growth
- Combines soft and hard sciences, responding to sponsors needs
- Courses hand-tailored to individual students needs
- Spectacular thesis work (plowing new ground)
- Broad and unusual sponsored research



# Research

- Computer Science

- *Agent and Multi-agent Systems, creation of adaptive and rational, self-organizing software behavior through the use of agents and multiagent systems*
- *Security Demonstrations, Multilevel Security and High Assurance, Network Quality of Security Service, Classified Network Challenge Problems, CyberDefense and PKI, Wireless Security*
- *Computer Networking, automated network control and provisioning, protocol analysis, tactical networks, and ad hoc networking*
- *Software Engineering, COTS integration and interoperability, Embedded systems, Software automation, Technology assessment, requirements analysis, solution prototyping DoD S/W problems*



# Research

- Operations Research
  - *Optimally Scheduling EA-6B Depot Maintenance*
  - *Planning Procurement and Deployment Of Space and Missile Assets*
  - *Research In Joint Warfare Modeling and Simulation, Emphasizing Information Warfare Issues*
  - *Statistical Research In Joint Interoperability Testing of Theater Missile Defense Systems*
  - *Tomahawk Land Attack Pre-designation*



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# Research

- Information Science
  - *Adaptive Architectures for Command and Control*



# Recapitulation

- Extraordinary Faculty
  - Engineering and Operations
  - Long term education while designing real systems
  - Tenured + industry and military experienced + aspirants
  - The common bonds: math, science and technology
- Struggle for Balance
  - Accredited graduate degrees + sponsors' military content
  - Curricula: refreshers + fundamentals + applications
- Supporting Military disciplines out of (beyond) academic disciplines
- “The Final Problem”: Achieve curricula for Combat Officers!